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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/853,506 05/11/01 JANECEK

M END920000132

EXAMINER

MM71/0913

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ALLIOLA, J  
ART-UNIT

PAPER NUMBER

2841  
DATE MAILED:

09/13/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

Application No.

09/853,506

Applicant(s)

Mark L. Janecek, John S. Kresge, Mark V. P

Examiner

Jose H Alcala

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-7, drawn to a printed circuit board with feed through, classified in class 174, subclass 262.
  - II. Claims 8-10, drawn to a method of making a printed circuit board with feed-through, classified in class 29, subclass 829.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as instead of making the first substrate with via through holes and then filling them with conductive adhesive, the printed circuit board can be made by inserting a pre-formed structure of conductive adhesive into the via through hole, thus preventing any undesired conductive adhesive material to spill over other parts of the substrate in the process of filling.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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4. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Mark Levi on 9/6/01 a provisional election was made with traverse to prosecute the invention of Group 1, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-10 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Drawings***

7. The drawings are objected to because in all figures there is a layer at the outside of the signal core, which is never labeled or mentioned in the Specification. In addition, there is a layer in the center of the Power core, which is also never labeled or mentioned in the Specification. Correction is required.

#### ***Specification***

8. The disclosure is objected to because of the following informalities: It is unclear if there is a difference between the "signal core layer" and the "signal core". In addition it is unclear if there is a difference between the "power core layer" and the "power core".

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 2-3,6-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 2 and 6, it is unclear in line 2 if the signal core layer is the signal core labeled as 12 in the drawings, or if it is the unlabeled film at the outside of the core in the figures. In addition, it is unclear in line 3 if the power core layer is the power core labeled as 14 in the drawings, or if it is the unlabeled film at the center of the core in the figures.

Regarding Claims 3 and 7, lines 1-2, it is not clear how a first substrate comprises a pair of outer signal core layers, is it two different substrates, or just two layers inside the substrate. It is further unclear, how is an inner power layer on a second substrate able to comprise an inner power core layer sandwiched between said pair of outer signal core layers, which are comprised on a first substrate. If the outer signal core layers are the same as the signal core of the drawings, then there are three substrates instead of two as stated on the independent claim 1.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

12. Claims 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Swamy (US Patent No. 5,576,519). As best understood by the examiner:

Regarding 5, Swamy teaches a multi-layered circuit structure (See Figure 2), comprising a first substrate (MLB #1) having conductive via through holes (See Figure 2) disposed therein; and a second substrate (MLB #2) laminated to said first substrate, and having conductive via through holes (See Figure 2) comprising conductive adhesive coated pads (See Interconnect Sheet in Figure 2) that align with, and make electrical contact with, the conductive via through holes of said substrate upon lamination of said first and second substrates. (See Figure 2).

Regarding Claim 6, Swamy teaches that the first substrate comprises a signal core layer (x1), and said second substrate comprises a power core layer (P).

Regarding Claim 7, Swamy teaches that first substrate comprises a pair of outer signal core layers (See the top surface of MLB #1 in Figure 2), and said second substrate comprises an inner power core layer (See middle of MLB #2 in Figure 2) sandwiched between outer signal core layers.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1-3,5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swamy (US Patent No. 5,576,519) in view of Bhatt et al. (US Patent No. 5,822,856). As best understood by the examiner:

Regarding Claim 1, Swamy teaches a multi-layered circuit structure (See Figure 2), comprising a first substrate (MLB #1) having conductive via through holes (See Figure 2) disposed therein; and a second substrate (MLB #2) laminated to said first substrate and having conductive via through holes (See Figure 2) that align with, and make electrical contact with, the conductive via through holes of said first substrate upon lamination of said first and second substrates. (See Figure 2).

Swamy fails to teach that the through hole of the second substrate is adhesive-filled. Bhatt et al. teaches a substrate (302) with an adhesive-filled through hole (350). It would have been obvious to one having ordinary skill in the art at the time the invention was made, to combine the teachings of Swamy and Bhatt, in order to have two substrates with conductive via-holes where the second substrate has an adhesive-filled through hole. Thus, improving the electrical conduction between the layers of the second substrate and with the first substrate, while preventing undesired conductive material to pour out of the troughhole.

Regarding Claim 2, Swamy teaches that the first substrate comprises a signal core layer (x1), and said second substrate comprises a power core layer (P).

Regarding Claim 3, Swamy teaches that first substrate comprises a pair of outer signal core layers (See the top surface of MLB #1 in Figure 2), and said second substrate comprises an inner power core layer (See middle of MLB #2 in Figure 2) sandwiched between outer signal core layers.

15. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swamy (US Patent No. 5,576,519) in view of Bhatt et al. (US Patent No. 5,822,856) and Further in view of Carr et al. (US Patent No. 5,337,219).

Swamy as modified by Bhatt, teaches all the limitations of the instant claimed invention as stated supra for Claim 1. In addition Swamy teaches that the via through holes of said signal layer have metallic pads (The top surfaces of the trough hole, see Figure 2), but fails to show that the via through holes of said inner power core layer comprise undercut contact surfaces and that the metallic pads make electrical contact with said undercut contact surfaces of said via through holes of said inner power core layer.

Carr teaches via through holes (200) comprising undercut contact surfaces (202). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to further modify the references, in order to have the via through holes of the inner power core layer comprising undercut contact surfaces and have the metallic pads making electrical contact with said undercut contact surfaces of said via through holes



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of said inner power core layer. Thus, making it easier to mount the first substrate unto the second substrate by having more surface area in contact with each other.

**Conclusion**

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references have some of the elements of the instant claimed invention: Pommer (US Patent No. 6,147,870), Miura et al. (US Patent No. 5,768,108), Chen et al. (US Patent No. 5,442,144) and Kamperman et al. (US Patent No. 5,734,560).

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose H Alcala whose telephone number is (703) 305-9844. The examiner can normally be reached from Monday to Friday.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on (703) 308-3301. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

19. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JHA  
September 10, 2001

*Albert W. Paladini 9-10-01*  
**ALBERT W. PALADINI**  
**PRIMARY EXAMINER**